Department of Permitting Services
Commercial Energy Code

255 Rockville Pike, 2nd Floor, Rockville, Maryland 20850

Montgomery County has adopted and is currently enforcing the 2000 Edition of International Energy Conservation Code (IECC). IECC is a performance-based national code, which regulates the design of new commercial and multi-family residential buildings for thermal resistance, air leakage, and mechanical, electrical, water-heating, and lighting systems efficiency.

There are several methods of achieving compliance with the IECC. For the purpose of this manual, only one method is offered. If this method does not satisfy the particular building design, the building must then comply with the requirements of ASHRAE/IES Energy Code for Commercial and High-Rise Residential Buildings or IECC Section 806 provided IECC Sections 802.1.2, 802.3, 803.2.1 or 803.3.1 as applicable, 803.2.2 or 803.3.2 as applicable, 803.2.3 or 803.3.3 as applicable, 803.2.8 or 803.3.6 as applicable, 803.2.9 or 803.3.7 as applicable, 804, 805.2, 805.3, and 805.5 are each satisfied.

BUILDING ENVELOPE REQUIREMENTS

Walls, roof assemblies, floors, glazing, and slabs on grade which are part of the building envelope for buildings where the window and glazed door area is not greater than 50 percent of the gross area of above-grade walls shall meet the requirements of following Tables, as applicable. Buildings with more glazing shall meet the applicable provisions of ASHRAE/IES Energy Code for Commercial and High-Rise Residential Buildings.

In utilizing the Tables as design guides, the following must be recognized:

1. All framed walls, floors, and ceilings not ventilated to allow moisture to escape shall be provided with an approved vapor retarder having a maximum permeance rating of 1.0 perm (5.72 × 10-8 g/Pa × s × m2).

2. The building envelope components shall meet each of the applicable requirements in the Tables below based on the percentage of wall that is glazed. The percentage of wall that is glazed shall be determined by dividing the aggregate area of rough openings for glazing (windows and glazed doors) in all the above-grade walls associated with the building envelope by the total gross area of all above-grade exterior walls that are a part of the building envelope. In buildings with multiple types of building envelope construction, each building envelope construction type shall be evaluated separately. Where the Tables below do not list a particular construction type, the applicable provisions of ASHRAE/IES Energy Code for Commercial and High-Rise Residential Buildings shall be used in lieu of this section.

3. Where both cavity and continuous insulation values are provided in the Table below, both requirements shall be met. Concrete masonry units (CMU) at least 8-inch (203 mm) nominal thickness with essentially equal amounts of mass on either side of the insulation layer are considered as having integral insulation, however, the thermal resistance of that insulation shall not be considered when determining compliance with one of the Tables. “Other masonry walls” shall include walls weighing at least 35 lb/ft2 (170 kg/m2) of wall surface area and do not include CMUs less than 8 inches (203 mm) nominal thickness.

4. The window projection factor shall be determined in accordance with following equation:

   PF = A/B

   where:

PF = Projection factor (decimal).
A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.
B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.

Where different windows or glass doors have different PF values, they shall each be evaluated separately, or an area-weighted PF value shall be calculated and used for all windows and glass doors.

5. Slab-on-grade insulation shall be placed on the outside of the foundation or on the inside of a foundation wall. The insulation shall extend downward from the top of the slab for a minimum of 48 inches (1219 mm) or downward to at least the bottom of the slab and then horizontally to the interior or exterior for a minimum total distance of 48 inches (1219 mm).

6. The below-grade wall insulation shall extend to a depth of 10 feet (3048 mm) below the outside finish ground level, or to the level of the floor, whichever is less.

7. Openings and penetrations in the building envelope shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.

WINDOW AND GLAZED DOOR AREA 10 PERCENT OR LESS OF ABOVE-GRADE WALL AREA			
ELEMENT	**CONDITION/VALUE**		
SKYLIGHT (U-factor)	0.8		
Slab or below-grade wall (R-value)	R-0		
Windows and glass doors	**SHGC**	**U- factor**	
PF< 0.25	Any	Any	
0.25≤ PF < 0.50	Any	Any	
PF≥ 0.50	Any	Any	
Roof assemblies (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss	R-19	R-17	
Metal joist/truss	R-25	R-18	
Concrete slab or deck	NA	R-17	
Metal purlin with thermal block	R-30	R-18	
Metal purlin without thermal block	X	R-18	
Floors over outdoor air or unconditioned space (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss	R-19	R-12	
Metal joist/truss	R-19	R-13	
Concrete slab or deck	NA	R-13	
Above-Grade Walls (R-value)	**No framing**	**Metal framing**	**Wood framing**
Framed			
R-value cavity	NA	R-11	R-11
R-value continuous	NA	R-0	R-0
CMU, ≥ 8 in, with integral insulation			
R-value cavity	NA	R-11	R-11
R-value continuous	R-5	R-0	R-0
Other Masonry Walls			
R-value cavity	NA	R-11	R-11
R-value continuous	R-5	R-0	R-0

WINDOW AND GLAZED DOOR AREA OVER 10 PERCENT BUT NOT GREATER THAN 25 PERCENT OF ABOVE-GRADE WALL AREA			
ELEMENT	**CONDITION/VALUE**		
SKYLIGHT (U-factor)	0.8		
Slab or below-grade wall (R-value)	R-0		
Windows and glass doors	**SHGC**	**U- factor**	
PF< 0.25	0.5	0.6	
0.25≤ PF < 0.50	0.6	0.6	
PF≥ 0.50	0.7	0.6	
Roof assemblies (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss	R-25	R-19	
Metal joist/truss	R-25	R-20	
Concrete slab or deck	NA	R-19	
Metal purlin with thermal block	R-30	R-20	
Metal purlin without thermal block	X	R-20	
Floors over outdoor air or unconditioned space (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss	R-19	R-12	
Metal joist/truss	R-19	R-13	
Concrete slab or deck	NA	R-13	
Above-Grade Walls (R-value)	**No framing**	**Metal framing**	**Wood framing**
Framed			
R-value cavity	NA	R-11	R-11
R-value continuous	NA	R-0	R-0
CMU, ≥ 8 in, with integral insulation			
R-value cavity	NA	R-11	R-11
R-value continuous	R-5	R-0	R-0
Other Masonry Walls			
R-value cavity	NA	R-11	R-11
R-value continuous	R-5	R-0	R-0

WINDOW AND GLAZED DOOR AREA OVER 25 PERCENT BUT NOT GREATER THAN 40 PERCENT OF ABOVE-GRADE WALL AREA			
ELEMENT	**CONDITION/VALUE**		
SKYLIGHT (U-factor)	0.8		
Slab or below-grade wall (R-value)	R-0		
Windows and glass doors	**SHGC**	**U- factor**	
PF< 0.25	0.4	0.5	
0.25≤ PF < 0.50	0.5	0.5	
PF≥ 0.50	0.6	0.5	
Roof assemblies (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss	R-25	R-19	
Metal joist/truss	R-25	R-20	
Concrete slab or deck	NA	R-19	
Metal purlin with thermal block	R-30	R-20	
Metal purlin without thermal block	X	R-20	
Floors over outdoor air or unconditioned space (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss	R-19	R-12	
Metal joist/truss	R-19	R-13	
Concrete slab or deck	NA	R-13	
Above-Grade Walls (R-value)	**No framing**	**Metal framing**	**Wood framing**
Framed			
R-value cavity	NA	R-11	R-11
R-value continuous	NA	R-0	R-0
CMU, ≥ 8 in, with integral insulation			
R-value cavity	NA	R-11	R-11
R-value continuous	R-5	R-0	R-0
Other Masonry Walls			
R-value cavity	NA	R-11	R-11
R-value continuous	R-5	R-0	R-0

WINDOW AND GLAZED DOOR AREA OVER 40 PERCENT BUT NOT GREATER THAN 50 PERCENT OF ABOVE-GRADE WALL AREA			
ELEMENT	**CONDITION/VALUE**		
SKYLIGHT (U-factor)	0.8		
Slab or below-grade wall (R-value)	R-0		
Windows and glass doors	**SHGC**	**U- factor**	
PF< 0.25	0.3	0.5	
0.25≤ PF < 0.50	0.4	0.5	
PF≥ 0.50	0.5	0.5	
Roof assemblies (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss	R-25	R-19	
Metal joist/truss	R-25	R-20	
Concrete slab or deck	NA	R-19	
Metal purlin with thermal block	R-30	R-20	
Metal purlin without thermal block	R-30	R-20	
Floors over outdoor air or unconditioned space (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss	R-19	R-12	
Metal joist/truss	R-19	R-13	
Concrete slab or deck	NA	R-13	
Above-Grade Walls (R-value)	**No framing**	**Metal framing**	**Wood framing**
Framed			
R-value cavity	NA	R-11	R-11
R-value continuous	NA	R-0	R-0
CMU, ≥ 8 in, with integral insulation			
R-value cavity	NA	R-11	R-11
R-value continuous	R-5	R-0	R-0
Other Masonry Walls			
R-value cavity	NA	R-11	R-11
R-value continuous	R-5	R-0	R-0

The following footnotes apply to the Tables listed above:

For SI: 1 inch = 25.4 mm.

a The values in Tables above determines code requirements for the proposed building based on window and glazed door area.
b "NA" indicates the condition is not applicable.
c An R-value of zero indicates no insulation is required.
d "Any" indicates any available product will comply.
e "X" indicates no complying option exists for this condition.

BUILDING MECHANICAL SYSTEM

Building mechanical system shall comply with Section 803 of the IECC. Compliance with Section 803 shall be achieved by meeting either Section 803.2 or 803.3.

Section 803.2 applies to buildings served by unitary or packaged HVAC equipment listed in Tables 803.2.2(1) through 803.2.2(5), each serving one zone and controlled by a single thermostat in the zone served. It also applies to two-pipe heating systems serving one or more zones, where no cooling system is installed.

Section 803.2 does not apply to fan systems serving multiple zones, nonunitary or nonpackaged HVAC equipment and systems or hydronic or steam heating and hydronic cooling equipment and distribution systems that provide cooling or cooling and heating which are covered by Section 803.3.

Section 803.2 applies to buildings served by HVAC equipment and systems not covered in Section 803.2

LIGHTING SYSTEMS

Building lighting system, including lighting controls, tandem wiring requirements, interior lighting power requirements and exterior lighting shall comply with Section 805 of the 2000 IECC.

COMMERCIAL ENERGY CODE COMPLIANCE FORM

Building Address: _____ Permit (A/P) # _____
Design Professional's Name: _____
Address: _____
Phone Number: (_____)_____

Glazing Area

100 × _____ ÷ _____ = _____
Glazing Area | Gross Wall Area | Percent Glazing Area

In the Table below, indicate the U-factor, SHGC, and R-value of the building elements as appropriate:

ELEMENT	CONDITION/VALUE		
SKYLIGHT (U-factor)			
Slab or below-grade wall (R-value)			
Windows and glass doors	**SHGC**	**U- factor**	
PF< 0.25			
0.25≤ PF < 0.50			
PF≥ 0.50			
Roof assemblies (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss			
Metal joist/truss			
Concrete slab or deck			
Metal purlin with thermal block			
Metal purlin without thermal block			
Floors over outdoor air or unconditioned space (R-value)	**Insulation between framing**	**Continuous insulation**	
All-wood joist/truss			
Metal joist/truss			
Concrete slab or deck			
Above-Grade Walls (R-value)	**No framing**	**Metal framing**	**Wood framing**
Framed			
R-value cavity			
R-value continuous			
CMU, ≥ 8 in, with integral insulation			
R-value cavity			
R-value continuous			
Other Masonry Walls			
R-value cavity			
R-value continuous			

Building Mechanical System Complies with (check all that applies):

- ☐ Section 803.2 of the 2000 IECC
- ☐ Section 803.3 of the 2000 IECC

Building Lighting Systems comply with

- ☐ Section 805 of the 2000 IECC

I hereby certify that the proposed building design represented in these construction documents has been designed to meet the requirements of the Montgomery County Energy Code.

Design Professional's Name _____ Original Seal & Signature _____ Date _____